

**REMARKS**

Claims 1-10 are the claims currently pending in the Application.

The Examiner objects to the claims because of non-idiomatic usage issues.

The claims are amended to clarify features recited thereby.

These amendments to the claims introduce no impermissible new matter.

Support for the amendment of claim 1 is found, by way of example, at Page 29, lines 24-28 of the Specification as originally filed. Support for the amendment of claim 2 is found, by way of example, at Page 15, lines 8-17 of the Specification as originally filed.

In the Office Action the Examiner sets forth objections to the Title.

Responsive to the objection to the Title, a new Title is provided.

Pursuant to the Examiner's objections to the Specification and request for a substitute Specification, Applicant herewith files a substitute Specification to remove non-idiomatic usage and minor errors in grammar, usage and style. No impermissible new matter is introduced by the amendments.

***Formal Matters***

Applicant thanks the Examiner for acknowledging the claim for foreign priority and the receipt of the priority document.

Applicant respectfully requests that the Examiner acknowledge review and consideration of the references cited in the Information Disclosure Statement filed April 19, 2004.

***Rejection of Claims 1-10 under 35 U.S.C. § 112, Second Paragraph***

Claims 1-10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite, citing a number of grammatical and idiomatic errors and ambiguities in the claims. This rejection is traversed.

It is respectfully submitted that a person of ordinary skill in the art would have readily understood the content of these claims as originally filed and that the grounds for the rejection amount to no more than grounds for a discretionary objection to the claims. However, to expedite prosecution of the Application, claims 1-10 are amended to clarify the recitations thereof.

***Rejection of Claims 1-10 under 35 U.S.C. § 102(e)***

Claims 1-10 are rejected under 35 U.S.C. § 102(e) as being anticipated by Lambert et al., U.S. Patent No. 6,038,601. This rejection is traversed.

Independent claims 1, 3, 5, 7 and 9 require, *inter alia*, that if it is determined that the content is received normally, the cache means are updated with the content received.

Lambert appears to disclose a method of storing and delivering documents over the internet, in which the client stores content in a data cache (Lambert, Figure 3; col. 5, lines 9-19, and lines 49-59); and custom expiration control, according to which when the caching server on the client's side is requested to retrieve content from the web, the server places the content in local storage and returns the content to the requester, and then subsequent requests for the same content are satisfied from the local storage rather than retrieved via internet (Lambert, col. 12, lines 36-44), such that each piece of content

is assigned an expiration date and the server satisfies requests for content from local storage until the expiration date is reached, after which time it checks at the content origination site whether the content has changed (Lambert, col. 12, lines 49-53). Further, Lambert appears to disclose automatic expiration control in which content is assigned an expiration date based on an expiration date computation algorithm, when the origination site for the content does not provide or does not know a content expiration date (Lambert, col. 32, lines 1-53).

Lambert does not disclose or suggest the cited features. Therefore, Lambert does not disclose or suggest the recitations of independent claims 1, 3, 5, 7 and 9.

Claims 2, 4, 6, 8, and 10 depend from independent claims 1, 3, 5, 7 and 9, respectively, and are therefore patentably distinguishable over the prior art for at least the reasons that independent claims 1, 3, 5, 7 and 9 are patentably distinguishable over the prior art.

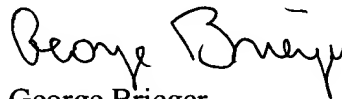
Further, claims 2, 4, 6, 8, and 10 require, *inter alia*, that when the content requested to be acquired from the content server does not exist or cannot be found, the corresponding content stored in the cache section is deleted.

Lambert does not disclose or suggest the cited features. Therefore, Lambert does not disclose or suggest the recitations of claims 2, 4, 6, 8, and 10.

For at least the reasons set forth in the foregoing discussion, Application believes that the Application is now allowable and respectfully requests that the Examiner reconsider the rejections and allow the Application. Should the Examiner have

any questions regarding this Amendment, or regarding the Application generally, the Examiner is invited to telephone the undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "George Brieger". The signature is fluid and cursive, with the first name "George" and last name "Brieger" clearly distinguishable.

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Encl - Substitute Specification  
- Marked-up version of Specification



CONTENTS ACQUIRING DEVICE, ~~CONTENTS ACQUIRING METHOD, AND~~  
SYSTEM USING VALID TERMS TO KEEP A CACHE UP-TO-DATE  
~~CONTENTS SERVER AND CONTENTS ACQUIRING SYSTEM~~

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BACKGROUND OF THE INVENTION

The present invention relates to a ~~contents~~content acquiring device for acquiring ~~contents~~content data stored in various ~~contents~~content servers, a ~~contents~~content acquiring  
10 method, a ~~contents~~content server and a ~~contents~~content acquiring system, and more particularly relates to a ~~contents~~content acquiring device capable of acquiring ~~contents~~content data stored in a cache section provided in the device in place of the ~~contents~~content data stored in the  
15 ~~contents~~content server.

In recent years, ~~a~~-semiconductor technology, ~~a~~-communication technology and the like have been developed. Therefore, it is possible to access a server on an internet

through a leased line or a public telecommunication network,  
 and to receive ~~provision of various types of contents~~content  
 services by using a personal computer or a portable telephone  
 in a ~~general~~ home as a client. However, it takes a time to  
 5 access various ~~contents~~content data through a communication  
 line having a low data transfer speed in the public  
 communication network or the like, and the number of  
 internet users has been rapidly ~~increased~~increasing so that a  
 throughput has been reduced. For this reason, it has been  
 10 desirable that the capacity of a server for preparing and  
storing a network ~~and storing contents~~content should be  
 enhanced.

As ~~a one of~~ countermeasure[[s]] to avoid such a  
 situation, a cache is provided in a ~~contents~~content acquiring  
 15 device for acquiring various ~~contents~~content data. Referring  
 to ~~the contents~~content data ~~which~~that are not required to  
 access a ~~contents~~content server on the internet, data are  
 fetched from the cache, thereby reducing data access through

~~a the network infra.~~

Fig. 1 shows the summary of the structure of a ~~contents~~content acquiring system to which the ~~contents~~content acquiring device for acquiring such ~~contents~~content data is applied. The ~~contents~~content acquiring system comprises a ~~contents~~content acquiring device group 15 including a personal computer 10, a ~~an~~ ~~information~~-portable terminal for managing a game terminal or personal information (Personal Digital Assistants: hereinafter referred to as a PDA) 11, a laptop computer 13 having a mobile communication terminal 12 such as a personal handy-phone system (hereinafter referred to as a PHS) or a portable telephone connected as a communication interface apparatus, a portable telephone 14 having a browser function and the like, and a ~~contents~~content server group 17, including first to Nth ~~contents~~content servers 16<sub>1</sub> to 16<sub>N</sub> for storing various ~~contents~~content data in a variety of fields ~~are~~ connected through a network 18, including for example a

public communication network or a leased line.

For example, in a browser, ~~to be a contents~~content data reading program ~~which~~ that is operated by the personal computer 10, a URL (Uniform Resource Locator) for specifying various information resources, such as the desirable ~~contents~~content data is specified, and desirable ~~contents~~content data ~~are~~ is acquired from the ~~contents~~content server corresponding to the specified URL through a network ~~infra~~-19 having the network 18. Based on the browser function of the portable telephone 14, moreover, the ~~contents~~content data are acquired from the ~~contents~~content server corresponding to the specified URL through a radio base station 20 for carrying out radio communication with the mobile communication terminal 12 and the portable telephone 14 and the network 19 comprising the network 18.

Each ~~contents~~content acquiring device in the ~~contents~~content acquiring device group 15 ~~is constituted by~~ includes the following sections.



Fig. 2 illustrates ~~the~~ a summary of the structure of the ~~contents~~content acquiring device. The ~~contents~~content acquiring device comprises an input section 25 for accepting various requests sent from a device user, an external

5 input/output section 26 having an interface function together with the network 19, a display section 27 for displaying ~~contents~~content data acquired by the external input/output section 26, a cache section 28 for temporarily storing the ~~contents~~content data, a timer section 29 for timing an update

10 time of the ~~contents~~content data stored in the cache section 28, and a control section 30 for controlling each section of the device.

Since the ~~contents~~content acquiring device has the cache function ~~ef~~for the ~~contents~~content data, the

15 ~~contents~~content once accessed, can be fetched and read without the network 19. The ~~contents~~content data stored in the cache section 28 are properly updated based on access information such as a ~~valid~~validity term or a final update

date, which is added to the ~~contents~~content data. Thus, to  
the extend possible, the newest ~~contents~~content ~~data are is~~  
 provided to the user without the network 19 ~~as much as~~  
 possible.

5       The control section 30 of the ~~contents~~content acquiring  
 device ~~carrying~~carries out such control ~~executes~~functions by  
executing various ~~processings~~processes in accordance with  
 a control program stored in a memory ~~which~~that is not shown,  
 for example.

10       Fig. 15 shows ~~the~~a summary of processing for  
~~contents~~content ~~of the control program to be~~acquisition and  
control executed by the control section of the conventional  
~~contents~~content acquiring device. When the control section  
 30 accepts the input of various device operation commands  
 15 ~~information~~ from the device user through the input section 25  
 (Step S35), it first analyzes the device operation ~~information~~  
commands thus accepted (Step S36). As a result of the  
 analysis, when the device operation ~~information~~commands

sent from the device user is a request for acquiring  
~~contents~~content (Step S37: Y), a predetermined  
~~contents~~content acquiring processing is carried out (Step S38)  
and ~~a series of processings~~ area processing section is ended  
5 (End). Moreover, when the device operation ~~information-~~  
~~command~~ sent from the device user is not the request for  
acquiring the ~~contents~~content ~~as a result of the analysis~~ (Step  
S37: N), ~~a processing~~ corresponding to other various operation  
~~information-commands~~ thus analyzed is carried out (Step S39)  
10 and ~~a series of processings~~ area processing section is ended  
(End).

Figs. 16 to 19 show ~~the~~ a summary of processing  
~~contents~~content ~~of for~~ the ~~contents~~content acquiring  
processing of ~~the~~ Step S38 in Fig. 15. The control section 30  
15 further analyzes the request for ~~contents~~content acquisition  
~~which that~~ is accepted by the input section 25 and specifies  
the requested ~~contents~~content data, and retrieves from the  
cache section 28 to decide whether or not there are present

the requested ~~contents~~content data (Step S40). When it is decided ~~that there are not the contents~~content data requested to be acquired by the cache section 28 are not present (Step S40: N), an instruction for transmitting a request for

5 acquiring the ~~contents~~content data is given to the external input/output section 26 (Step S41). The external input/output section 26 transmits a ~~contents~~content acquisition request in response to the instruction given from the control section 30, through the network 19 to the

10 ~~contents~~content server ~~for storing that stores the~~ contentscontent data ~~acquired and requested.~~

The external input/output section 26 monitors the normal receipt of the ~~contents~~content data from the ~~contents~~content server ~~to be serving on a contents~~content

15 request destination through the network 19, and transfers the received ~~contents~~content data to the control section 30 when detecting the normal receipt. When the control section 30 acquires the ~~contents~~content data normally received by the

external input/output section 26 (Step S42: Y), it updates the cache section 28 ~~by using with~~the acquired contentscontent (Step S43) and gives an instruction for displaying the received contentscontent to the display section 27 (Step S44).

5 The display section 27 displays the received contentscontent in response to the instruction given from the control section 30. Then, ~~a series of processings area~~ processing section is ended (End).

On the other hand, when the external input/output

10 section 26 cannot receive the contentscontent data from the contentscontent server ~~to be~~that is the acquisition request destination through the network 19 and the control section 30 cannot acquire the contentscontent data (Step S42: N), the control section 30 deletes the contentscontent stored in the

15 cache section 28 and gives the display section 27 an instruction to display ~~of contentscontent~~ acquisition failure (Step S45). The display section 27 ~~gives an instruction~~ displays an indication of the contentscontent acquisition

failure in response to the instruction sent from the control section 30. Then, ~~a series of processings area processing~~ section is ended (END).

When it is decided that the cache section 28 has the  
 5 ~~contents~~content data required to be acquired at the Step S40  
 (Step S40: Y), the control section 30 decides whether or not a  
~~valid~~validity term is added to the ~~contents~~content data  
 requested to be acquired which are stored in the cache section  
 28 (Step S46). The ~~valid term~~validity term ~~is~~ may be, for  
 10 example added at the time of the acquisition from the  
~~contents~~content server, ~~for example~~. When the ~~valid~~  
~~term~~validity term is added to the ~~contents~~content stored in  
 the cache section 28 (Step S46: Y), it is decided whether or  
 not a current ~~data~~date timed by the timer section 29 ~~expires~~  
 15 renders expired the ~~valid term~~validity term added to the  
~~contents~~content (Step S47). When it is decided that the  
 current date timed by the timer section 29 ~~expires~~ renders  
expired the ~~valid term~~validity term added to the

~~contents~~content (Step S47: Y), the control section 30 further  
 decides whether or not a final update date is added when the  
~~contents~~content stored in the cache section 28 are acquired  
 (Step S48). If it is decided that the final update date is to  
 5 be added when the ~~contents~~content ~~are~~ is acquired (Step S48:  
 Y), the control section 30 gives an instruction for  
 transmitting a ~~contents~~content acquisition request on  
 condition that the update is carried out after the final update  
 date to the external input/output section 26 (Step S49). The  
 10 ~~contents~~content acquisition request is valid only if in the  
content server the ~~contents~~content ~~are~~ has been updated after  
 the final update date ~~in the contents~~content server. The  
 external input/output section 26 transmits such a  
~~contents~~content acquisition request in response to an  
 15 instruction sent from the control section 30.

The external input/output section 26 monitors the  
 normal receipt of the ~~contents~~content data from the  
~~contents~~content server ~~to be a~~ serving as the ~~contents~~content

request destination through the network 19, and transfers the received ~~contents~~content data to the control section 30 when detecting the normal receipt. When the control section 30 acquires normally the ~~contents~~content data normally received

5 by the external input/output section 26 (Step S50: Y), it updates the cache section 28 by using the acquired ~~contents~~content (Step S51) and gives an instruction for displaying the received ~~contents~~content to the display section 27 (Step S52). The display section 27 displays the received

10 ~~contents~~content in response to the instruction given from the control section 30. Then, ~~a series of processings area~~ processing section is ended (END).

On the other hand, when the external input/output section 26 cannot receive the ~~contents~~content data from the

15 ~~contents~~content server ~~to be~~ serving as the acquisition request destination through the network 19 and the control section 30 cannot acquire the ~~contents~~content data at ~~the~~ Step S50 (Step S50: N), the reason why the ~~contents~~content cannot be



acquired is ~~analyzes~~analyzed. For example, a response sent from the ~~contents~~content server is analyzed. For example, date as a result of the analysis carried out according to the response from the content server, when the reason why the

5 ~~contents~~content data cannot be acquired is that the ~~contents~~content on the ~~contents~~content server side ~~are~~ was updated after the final update ~~date as a result of the analysis carried out according to the response from the~~

~~contents~~content server, for example, (Step S53: Y), the control

10 section 30 fetches the ~~contents~~content previously acquired by the cache section 28 and gives the display section 27 an instruction to display ~~the~~that ~~contents~~content (Step S54).

The display section 27 displays the ~~contents~~content according to the instruction sent from the control section 30. Then, a

15 ~~series of processings are~~ a processing section is ended (END).

When the ~~contents~~content data cannot be acquired for another reason except that the ~~contents~~content ~~on~~ data at the ~~contents~~content server side are not updated after the final

update date as a result of the analysis carried out according to the response sent from the ~~contents~~content server, for example, at the Step S53 (Step S53: N), the control section 30 deletes the ~~contents~~content stored in the cache section 28

5 (Step S55) and gives an instruction for displaying ~~contents~~content acquisition failure to the display section 27 (Step S56). The display section 27 displays the ~~contents~~content acquisition failure in response to the instruction sent from the control section 30. Then, ~~a series~~

10 ~~of processings~~area processing section is ended (END).

When the ~~valid term~~validity term is not added to the ~~contents~~content stored in the cache section 28 at the Step S46 (Step S46: N), the control section 30 gives the external input/output section 26 an instruction for transmitting a

15 ~~contents~~content acquisition request on condition that the ~~contents~~content stored in the cache section 28 ~~are~~is updated after the date that the ~~contents~~content ~~are~~is acquired (Step S57). The ~~contents~~content acquisition request is valid only

when the ~~contents~~content stored in the cache section 28 are updated after the date that the ~~contents~~content are acquired in the ~~contents~~content server. The external input/output section 26 transmits such a ~~contents~~content acquisition request in response to the instruction sent from the control section 30.

The external input/output section 26 monitors the normal receipt of the ~~contents~~content data from the ~~contents~~content server ~~to be a~~ serving as ~~contents~~content request destination through the network 19, and transfers the received ~~contents~~content data to the control section 30 when detecting the normal receipt. When the control section 30 normally acquires the ~~contents~~content data ~~normally~~ received by the external input/output section 26 (Step S58: Y), it updates the cache section 28 by using the acquired ~~contents~~content (Step S59) and gives an instruction for displaying the received ~~contents~~content to the display section 27 (Step S60). The display section 27 displays the received

~~contents~~content in response to the instruction given from the control section 30. Then, ~~a series of processings area~~  
processing section is ended (END).

On the other hand, when the external input/output  
 5 section 26 cannot receive the ~~contents~~content data from the  
~~contents~~content server ~~to be the acquisition request~~  
~~destination~~ through the network 19 and the control section 30  
 cannot acquire the ~~contents~~content data at the Step S58 (Step  
 S58: N), the reason why the ~~contents~~content cannot be  
 10 acquired is analyzes analyzed. For example, as a result of the  
analysis carried out a response sent from the ~~contents~~content  
 server is analyzed. For example, when the reason why the  
~~contents~~content data cannot be acquired is that the  
~~contents~~content ~~on~~ ~~at~~ the ~~contents~~content server side ~~are~~ ~~was~~  
 15 not updated after the date that the ~~contents~~content stored in  
 the cache section 28 ~~are~~ were acquired ~~as a result of the~~  
~~analysis carried out~~ according to the response from the  
~~contents~~content server, for example, (Step S61: Y), the control

section 30 fetches the ~~contents~~content previously acquired by the cache section 28 and gives the display section 27 an instruction to display the ~~contents~~content (Step S62). The display section 27 displays the ~~contents~~content according to the instruction sent from the control section 30. Then, a series of ~~processings~~area processing section is ended (END).

When the ~~contents~~content data cannot be acquired for another reason except that the ~~contents~~content on the ~~contents~~content server side are not updated after the date that the ~~contents~~content stored in the cache section 28 are acquired as a result of the analysis carried out according to the response sent from the ~~contents~~content server, for example, at the Step S53 (Step S61: N), the control section 30 deletes the ~~contents~~content stored in the cache section 28 (Step S63) and gives an instruction for displaying ~~contents~~content acquisition failure to the display section 27 (Step S64). The display section 27 displays the ~~contents~~content acquisition failure in response to the

instruction sent from the control section 30. Then, ~~a series of processings area processing section is~~ ended (END).

When it is decided that the current time obtained by the timer section 29 does not expire the ~~valid term~~validity term added to the ~~contents~~content at the Step S47 (Step S47: N), the control section 30 fetches the ~~contents~~content previously acquired by the cache section 28 and gives the display section 27 an instruction to display the ~~contents~~content (Step S65). The display section 27 displays the ~~contents~~content in response to the instruction sent from the control section 30. Then, ~~a series of processings area processing section is~~ ended (END).

When the final update date is not added to the ~~contents~~content stored in the cache section 28 at the Step S48 (Step S48: N), the control section 30 gives the external input/output section 26 an instruction for transmitting a ~~contents~~content acquisition request on condition that the ~~contents~~content stored in the cache section 28 ~~is~~are updated

after the ~~valid term~~validity term added to the ~~contents~~content stored in the cache section 28 (Step S66). The ~~contents~~content acquisition request is valid only when the ~~contents~~content stored in the cache section 28 ~~is~~are updated

5 after the ~~valid term~~validity term added to the ~~contents~~content added to the cache section 28. The external input/output section 26 transmits such a ~~contents~~content acquisition request in response to the instruction sent from the control section 30.

10 The external input/output section 26 monitors the normal receipt of the ~~contents~~content data from the ~~contents~~content server to be a ~~contents~~content request destination through the network 19, and transfers the received ~~contents~~content data to the control section 30 when

15 detecting the normal receipt. When the control section 30 normally acquires the ~~contents~~content data ~~normally~~ received by the external input/output section 26 (Step S67: Y), it updates the cache section 28 by using the acquired

~~contents~~content (Step S68) and gives an instruction for displaying the received ~~contents~~content to the display section 27 (Step S69). The display section 27 displays the received ~~contents~~content in response to the instruction given from the control section 30. Then, ~~a series of processings are a~~  
 5 processing section is ended (END).

On the other hand, when the external input/output section 26 cannot receive the ~~contents~~content data from the ~~contents~~content server to be the acquisition request destination through the network 19 and the control section 30  
 10 cannot acquire the ~~contents~~content data at the Step S67 (Step S67: N), the reason why the ~~contents~~content cannot be acquired is analyzed. For example, a response sent from the ~~contents~~content server is analyzed. For example, when  
 15 the reason ~~why~~ the ~~contents~~content data cannot be acquired is that the ~~contents~~content on the ~~contents~~content server side ~~is are~~ not updated after the ~~valid term~~validity term added to the ~~contents~~content stored in the cache section 28 ~~is are~~



acquired as a result of the analysis carried out according to the response from the ~~contents~~content server, for example, (Step S70: Y), the control section 30 fetches the ~~contents~~content previously acquired by the cache section 28  
5 and gives the display section 27 an instruction to display the ~~contents~~content (Step S71). The display section 27 displays the ~~contents~~content according to the instruction sent from the control section 30. Then, ~~a series of processings area~~  
processing section is ended (END).

10 When the ~~contents~~content data cannot be acquired for ~~any another~~ reason except that the ~~contents~~content on the ~~contents~~content server side ~~is~~are not updated after the ~~valid-~~  
~~term~~validity term added to the ~~contents~~content stored in the cache section 28 are acquired as a result of the analysis  
15 carried out according to the response sent from the ~~contents~~content server, for example, at the Step S70 (Step S70: N), the control section 30 deletes the ~~contents~~content stored in the cache section 28 (Step S72) and gives an

instruction for displaying ~~contents~~content acquisition failure  
 to the display section 27 (Step S73). The display section 27  
 displays the ~~contents~~content acquisition failure in response to  
 the instruction sent from the control section 30. Then, a  
 5 ~~series of processings are~~ a processing section is ended (END).

Fig. 20 represents a main part of the processing  
~~contents~~content of the update processing of the cache section  
 shown in Figs. 16, 17 and 19. The cache section 28 has a  
 cache control section for controlling the whole cache section  
 10 28 and carries out the following processing to update the  
 cache section 28. When the cache control section in the  
 cache section 28 is to store ~~contents~~content in the cache  
 section 28 in response to an instruction sent from the control  
 section 30, it first retrieves that the same ~~contents~~content  
 15 ~~is~~ are stored in the cache section 28 or not (Step S80). When  
 the cache control section detects that the same  
~~contents~~content ~~is~~ are stored in the cache section 28 (Step  
 S80: Y), it deletes the same ~~contents~~content stored in the

cache section 28 (Step S81) and carries out the rotation of the ~~contents~~content (Step S82).

On the other hand, when the cache control section detects that the same ~~contents~~content ~~is~~are not stored in the  
 5 cache section 28 at the Step S80 (Step S80: N), it is decided whether the ~~contents~~content ~~is~~are stored in all entries of the cache section 28 (Step S83). When it is decided that the ~~contents~~content ~~is~~are stored in all entries (Step S83: Y), the cache control section deletes ~~contents~~content on the head of  
 10 the cache section 28 (Step S84) and carries out the rotation of the ~~contents~~content (Step S85).

After the rotation of the cache section 28 is carried out at the Steps S82 and S85 or it is decided that the ~~contents~~content ~~is~~are not stored in all the entries of the cache  
 15 section 28 at the Step S83 (Step S83: N), the cache control section adds the ~~contents~~content requested to be stored by the control section 30 to the end of the cache section 28 (Step S86).

In this case, the cache control section decides whether or not a ~~valid-term~~validity term is added to the ~~contents~~content requested to be stored by the control section 30 (Step S87). When it is decided that the ~~valid-term~~validity term is added to the ~~contents~~content requested to be stored by the control section 30, the cache control section (Step S87: Y), the cache control section adds the ~~valid-term~~validity term to the ~~contents~~content finally stored in the cache section 28 (Step S88). On the other hand, when the cache control section decides that the ~~valid-term~~validity term is not added to the ~~contents~~content requested to be stored by the control section 30 at the Step S87 (Step S87: N), "no ~~valid-term~~validity term" is added to the ~~contents~~content finally stored in the cache section 28 (Step S89).

Next, the cache control section decides whether or not a final update date is added to the ~~contents~~content requested to be stored by the control section 30 (Step S90). If it is decided that the final update date is added to the

~~contents~~content requested to be stored by the control section  
 30 (Step S90: Y), the cache control section ~~added~~adds the  
 final update date to the ~~contents~~content finally stored in the  
 cache section 28 (Step S91). On the other hand, when the  
 5 cache control section decides that the final update date is not  
 added to the ~~contents~~content requested to be stored by the  
 control section 30 at the Step S90 (Step S90: N), "no final  
 update date" is added to the ~~contents~~content finally stored in  
 the cache section 28 (Step S92). Finally, the cache control  
 10 section adds a current date timed by the timer section 29 as a  
~~contents~~content acquisition date to the ~~contents~~content  
 finally stored in the cache section 28 (Step S93) and ~~a series~~  
~~of processings area processing section is~~ ended (END).

In such a conventional ~~contents~~content acquiring device,  
 15 the ~~contents~~content server collectively manages the  
~~contents~~content data. Therefore, there has been a problem  
 in that it is necessary to carry out ~~a~~an update query with  
 respective update conditions for the ~~contents~~content server

as in the Step S49, the Step S57 or the Step S66 in order to update the contentscontent. Moreover, this is the case even if the contentscontent ~~are was~~ updated within the ~~valid-~~  
~~term~~validity term in the contentscontent acquiring device.

5 ~~To the contrary~~On the other hand, even if the contentscontent is stored in the cache section 28 in the contentscontent acquiring device, the contentscontent data are displayed by using the contentscontent data in the cache section 28 without acquiring the contentscontent. Thus, there has been

10 a problem in that a current version of the contentscontent data collectively managed on the ~~convents-content~~ server cannot always be read.

## SUMMARY OF THE INVENTION

15 It is an object of the present invention to provide a contentscontent acquiring device capable of minimizing to the extend possible ~~an-acquisition request-requests~~ for contentscontent data and of acquiring contentscontent data

having a current version ~~as much as possible~~.

- A first aspect of the present invention is directed to a ~~contents~~content acquiring device comprising: (a) cache means for temporarily storing received ~~contents~~content, (b)
- 5 acquisition request accepting means for accepting an acquisition request for ~~contents~~content, (c) cache deciding means for deciding whether or not the ~~contents~~content requested by the acquisition request ~~are~~is stored in the cache means ~~or not~~, (d) ~~valid expiration~~validity expiration setting
- 10 means for setting a ~~valid expiration~~validity expiration as an update expiration of the ~~contents~~content based on a ~~valid~~term~~validity term~~ of the ~~contents~~content when it is decided by the cache deciding means that the ~~contents~~content ~~are~~is stored in the cache means, (e) acquisition request
- 15 transmitting means for transmitting the acquisition request for the ~~contents~~content when the ~~contents~~content ~~are out of~~have past the ~~valid expiration~~validity expiration set by the ~~valid expiration~~validity expiration setting means, and (f)

~~contents~~content receiving means for receiving ~~contents~~content based on the acquisition request transmitted from the acquisition request transmitting means.

According to the first aspect of the present invention, in  
 5 the ~~contents~~content acquiring device comprising the cache means, it is decided whether or not the ~~contents~~content requested to be acquired are stored in the cache means. If it is decided that the ~~contents~~content requested to be acquired are stored, the acquisition request for the ~~contents~~content  
 10 requested to be acquired is transmitted when the ~~contents~~content ~~are out of~~has past the ~~valid-~~  
~~expiration~~validity expiration set based on the ~~valid-~~  
~~term~~validity term of the stored ~~contents~~content. Thus, desirable ~~contents~~content ~~is~~are received.

15 A second aspect of the present invention is directed to the ~~contents~~content acquiring device according to the first aspect of the present invention, further comprising ~~valid-~~  
~~term~~validity term holding means for previously holding a



~~valid term~~validity term, and ~~valid term~~validity term addition  
 deciding means for deciding whether or not the valid-  
~~term~~validity term is added to the ~~contents~~content, ~~or not~~  
 when it is decided by the cache deciding means that the  
 5 ~~contents~~content are stored in the cache means, the ~~valid-~~  
~~expiration~~validity expiration setting means serving to set the  
~~valid expiration~~validity expiration based on a ~~valid-~~  
~~term~~validity term held by the ~~valid term~~validity term holding  
 means when it is decided by the ~~valid term~~validity term  
 10 addition deciding means that the ~~valid term~~validity term is  
 not added.

According to the second aspect of the present invention,  
 when the ~~valid term~~validity term of the ~~contents~~content  
 stored in the cache means is not added, the ~~valid-~~  
 15 ~~expiration~~validity expiration is set by using the ~~valid-~~  
~~term~~validity term previously held.

A third aspect of the present invention is directed to a  
 method of acquiring ~~contents~~content comprising the steps of

(a) accepting means for accepting an acquisition request for ~~contents~~content, (b) deciding whether or not the ~~contents~~content requested by the acquisition request accepted at the acquisition request accepting step are stored in a cache  
 5 for temporarily storing received ~~contents~~content, (c) setting a ~~valid expiration~~validity expiration as an update expiration of the ~~contents~~content based on a ~~valid term~~validity term added to the ~~contents~~content when it is decided at the cache deciding step that the ~~contents~~content are stored in the cache,  
 10 (d) transmitting the acquisition request for the ~~contents~~content when the ~~contents~~content are out of the ~~valid expiration~~validity expiration set at the ~~valid expiration~~validity expiration setting step, and (e) receiving ~~contents~~content corresponding to the acquisition request  
 15 transmitted at the acquisition request transmitting step.

According to the third aspect of the present invention, the ~~contents~~content acquisition request is accepted at the acquisition request step and it is decided at the cache

deciding step whether or not the contentscontent requested by the acquisition request accepted at the cache deciding step isare stored in the cache ~~or not~~. When it is decided that the same contentscontent isare stored, the ~~valid-~~

5 ~~expiration~~validity expiration is set based on the ~~valid-~~  
~~term~~validity term added to the contentscontent stored in the cache at the ~~valid-~~expirationvalidity expiration setting step. When the contentscontent isare not within the set ~~valid-~~  
~~expiration~~validity expiration at the present time, the

10 contentscontent acquisition request is transmitted at the acquisition request transmitting step and corresponding contentscontent are received at the contentscontent receiving step.

A fourth aspect of the present invention is directed to

15 the method of acquiring contentscontent according to the third aspect of the present invention, further comprising the step of deciding whether or not the ~~valid-term~~validity term is added to the contentscontent ~~or not~~ when it is decided at the

cache deciding step that the ~~contents~~content are stored in the cache, the ~~valid-expiration~~validity expiration setting step serving to set the ~~valid-expiration~~validity expiration based on a previously held ~~valid-term~~validity term when it is decided  
 5 at the ~~valid-term~~validity term addition deciding step that the ~~valid-term~~validity term is not added.

According to the fourth aspect of the present invention, when it is decided at the cache deciding step that the ~~contents~~content ~~is~~are stored in the cache, it is decided at the  
 10 ~~valid-term~~validity term addition deciding step whether or not the ~~valid-term~~validity term is added to the ~~contents~~content stored in the cache ~~or not~~. When it is decided that the ~~valid-term~~validity term is not added, the ~~valid-expiration~~validity expiration is set based on the ~~valid-term~~validity term  
 15 previously held at the ~~valid-expiration~~validity expiration setting step. Consequently, the optimum ~~contents~~content acquisition request can also be carried out for the ~~contents~~content received from an existing ~~contents~~content

server in accordance with a parameter of the ~~valid-~~  
~~term~~validity term.

A fifth aspect of the present invention is directed to a  
~~contents~~content server comprising (a) ~~contents~~content storing  
 5 means for previously storing ~~contents~~content, (b) acquisition  
 request receiving means for receiving an acquisition request  
 transmitted when the ~~contents~~content are out of a ~~valid-~~  
~~expiration~~validity expiration to be an update expiration of the  
~~contents~~content stored in a cache which are set based on a  
 10 ~~valid term~~validity term of the ~~contents~~content, and (c)  
~~contents~~content transmitting means for fetching the  
~~contents~~content requested by the acquisition request received  
 by the acquisition request receiving means from the  
~~contents~~content storing means and for transmitting the  
 15 ~~contents~~content to a destination of the acquisition request.

According to the fifth aspect of the present invention,  
 the transmitted acquisition request is received only when the  
~~contents~~content ~~is~~are not within the ~~valid expiration~~validity

~~expiration~~ set based on the ~~valid-term~~validity term of the  
~~contents~~content stored in the cache, and corresponding  
~~contents~~content ~~is~~are fetched from prestored ~~contents~~content  
in the ~~contents~~content server and ~~is~~are transmitted to the  
5 destination of the acquisition request.

A sixth aspect of the present invention is directed to  
the ~~contents~~content server according to the fifth aspect of the  
present invention, wherein the ~~valid-expiration~~validity  
~~expiration~~ is set based on a ~~valid-term~~validity term  
10 previously held in the destination of the acquisition request  
when the ~~valid-term~~validity term is not added to the  
~~contents~~content stored in the cache.

According to the sixth aspect of the present invention,  
when the ~~valid-term~~validity term is not added to the  
15 ~~contents~~content stored in the cache, the ~~valid-~~  
~~expiration~~validity expiration is set based on the ~~valid-~~  
~~term~~validity term previously held in the destination of the  
acquisition request. Consequently, it is not necessary to

give a parameter of the ~~valid term~~validity term to all the ~~contents~~content prestored on the ~~contents~~content server side. Thus, existing equipment can be applied.

A seventh aspect of the present invention is directed to

5 a ~~contents~~content acquiring system comprising: (a) a ~~contents~~content acquiring device for transmitting an acquisition request of ~~contents~~content to be an acquisition request object prestored through a network when the ~~contents~~content ~~is~~are out of a ~~valid expiration~~validity

10 expiration to be an update expiration of the ~~contents~~content set based on a ~~valid term~~validity term of the ~~contents~~content and for receiving ~~contents~~content corresponding thereto, and (b) a ~~contents~~content server for reading ~~contents~~content corresponding to an acquisition request transmitted from the

15 ~~contents~~content acquiring device from ~~contents~~content in various fields which are prestored, and for transmitting the ~~contents~~content corresponding to the acquisition request to the ~~contents~~content acquiring device through the network.

According to the seventh aspect of the present invention,  
in the ~~contents~~content acquiring device, the acquisition  
request of the ~~contents~~content to be a prestored acquisition  
request object is transmitted through the network when the  
5 ~~contents~~content ~~is~~are not within the ~~valid~~expiration~~validity~~  
expiration set based on the ~~valid~~term~~validity~~ term of the  
~~contents~~content, the ~~contents~~content corresponding to the  
acquisition request transmitted from the ~~contents~~content  
acquiring device ~~is~~are read from the ~~contents~~content in  
10 various fields prestored in the ~~contents~~content server and  
~~is~~are returned through the network. Consequently, a traffic  
on the network can be relieved and a large number of  
~~contents~~content acquisition requests can be processed.

An eighth aspect of the present invention is directed to  
15 the ~~contents~~content acquiring system according to the seventh  
aspect of the present invention, wherein the ~~valid~~  
~~expiration~~validity expiration is set based on a predetermined  
~~valid~~term~~validity~~ term previously held when a ~~valid~~



~~term~~validity term is not added to the ~~contents~~content to be an acquisition object.

According to the eighth aspect of the present invention, the ~~valid-expiration~~validity expiration is set based on a  
 5 predetermined ~~valid-term~~validity term previously held when a  
~~valid-term~~validity term is not added to the ~~contents~~content to be an acquisition object. Consequently, an existing device can be applied to reduce an equipment investment and to minimize the acquisition request. Thus, it is possible to  
 10 provide a comfortable ~~contents~~content service for a user to request the ~~contents~~content acquisition.

A ninth aspect of the present invention is directed to a ~~contents~~content acquiring system comprising (a) a  
~~contents~~content acquiring device including cache means for  
 15 temporarily storing received ~~contents~~content, acquisition request accepting means for accepting an acquisition request for ~~contents~~content, cache deciding means for deciding whether or not the ~~contents~~content requested by the

acquisition request are stored in the cache means ~~or not, valid~~  
~~expiration~~validity expiration setting means for setting a ~~valid~~  
~~expiration~~validity expiration as an update expiration of the  
~~contents~~content based on a ~~valid term~~validity term added to  
 5 the ~~contents~~content when it is decided by the cache deciding  
 means that the ~~contents~~content are stored in the cache means,  
 acquisition request transmitting means for transmitting the  
 acquisition request for the ~~contents~~content when the  
~~contents~~content are out of the ~~valid expiration~~validity  
 10 expiration set by the ~~valid expiration~~validity expiration  
 setting means, and ~~contents~~content receiving means for  
 receiving ~~contents~~content based on the acquisition request  
 transmitted from the acquisition request transmitting means,  
 and (b) a ~~contents~~content server including ~~contents~~content  
 15 storing means for previously storing ~~contents~~content,  
 acquisition request receiving means for receiving an  
 acquisition request transmitted from the acquisition request  
 transmitting means, and ~~contents~~content transmitting means

for fetching the ~~contents~~content requested by the acquisition request received by the acquisition request receiving means from the ~~contents~~content storing means and for transmitting the ~~contents~~content to the acquisition request.

5        According to the ninth aspect of the present invention, in the ~~contents~~content acquiring device comprising the cache means, it is decided by the cache deciding means whether or not the ~~contents~~content to be an acquisition request object accepted by the acquisition request accepting means is stored  
10 in the cache means. When it is decided that the same ~~contents~~content are stored in the cache means, the ~~valid-~~  
~~expiration~~validity expiration is set based on the ~~valid-~~  
~~term~~validity term added to the stored ~~contents~~content by the ~~valid-~~  
~~expiration~~validity expiration setting means, and the  
15 acquisition request of the ~~contents~~content is transmitted to the ~~contents~~content server only when the ~~contents~~content are not within the ~~valid-~~  
~~expiration~~validity expiration at the present time. The ~~contents~~content server prestores the

~~contents~~content, and fetches the ~~contents~~content requested by the acquisition request from the ~~contents~~content storing means and transmits the same ~~contents~~content to the ~~contents~~content acquiring device. The ~~contents~~content acquiring device receives the ~~contents~~content transmitted from the ~~contents~~content server.

A tenth aspect of the present invention is directed to the ~~contents~~content acquiring system according to the ninth aspect of the present invention, further comprising ~~valid-~~  
~~term~~validity term holding means for previously holding a  
~~valid-term~~validity term, and ~~valid-term~~validity term addition  
deciding means for deciding whether or not the ~~valid-~~  
~~term~~validity term is added to the ~~contents~~content ~~or not~~ when  
it is decided by the cache deciding means that the  
~~contents~~content ~~is~~are stored in the cache means, the ~~valid-~~  
~~expiration~~validity expiration setting means serving to set the  
~~valid-expiration~~validity expiration based on a ~~valid-~~  
~~term~~validity term held by the ~~valid-term~~validity term holding

means when it is decided by the ~~valid-term~~validity term addition deciding means that the ~~valid-term~~validity term is not added.

According to the tenth aspect of the present invention,  
 5 when the ~~valid-term~~validity term of the ~~contents~~content stored in the cache mean is not added, the ~~valid-~~  
~~expiration~~validity expiration is set by using the ~~valid-~~  
~~term~~validity term previously held. Consequently, it is  
 possible to minimize the acquisition request for the  
 10 ~~contents~~content data from the ~~contents~~content acquiring device and to acquire the ~~contents~~content data having a current version as much as possible irrespective of the presence of the addition of a parameter of the ~~valid-~~  
~~term~~validity term to the ~~contents~~content in the  
 15 ~~contents~~content acquiring system.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram showing the summary of a structure

of a ~~contents~~content acquiring system to which a  
~~contents~~content acquiring device is applied,

Fig. 2 is a block diagram showing the schematic  
structure of the ~~contents~~content acquiring device,

5 Fig. 3 is a flow chart showing the whole summary of the  
processing ~~contents~~content of a ~~contents~~content acquisition  
processing to be carried out by the ~~contents~~content acquiring  
device according to the present embodiment,

Fig. 4 is a flow chart showing a part of the summary of  
10 the processing ~~contents~~content of the ~~contents~~content  
acquisition processing to be carried out by the  
~~contents~~content acquiring device according to the present  
embodiment in Fig. 3,

Fig. 5 is a flow chart showing a part of the summary of  
15 the processing ~~contents~~content of the ~~contents~~content  
acquisition processing to be carried out by the  
~~contents~~content acquiring device according to the present  
embodiment in Fig. 3,

Fig. 6 is a flow chart showing a part of the summary of the processing ~~contents~~content of the ~~contents~~content acquisition processing to be carried out by the ~~contents~~content acquiring device according to the present  
5 embodiment in Fig. 3,

Fig. 7 is a flow chart showing a part of the summary of the processing ~~contents~~content of the ~~contents~~content acquisition processing to be carried out by the ~~contents~~content acquiring device according to the present  
10 embodiment in Fig. 3,

Fig. 8 is a flow chart showing a first part of the summary of the processing ~~contents~~content of an update processing of a cache section in the ~~contents~~content acquiring device according to the present embodiment,

15 Fig. 9 is a flow chart showing a second part of the summary of the processing ~~contents~~content of an update processing of a cache section in the ~~contents~~content acquiring device according to the present embodiment,

Fig. 10 is a sequence diagram showing a data flow in each section when ~~contents~~content data are successfully acquired from a ~~contents~~content server if the cache section has no ~~contents~~content in a ~~contents~~content acquiring system  
 5 to which the ~~contents~~content acquiring device according to the present embodiment is applied,

Fig. 11 is a sequence diagram showing a data flow in each section when the acquisition of ~~contents~~content data from a ~~contents~~content server ~~has~~is failed if the cache section  
 10 has no ~~contents~~content in a ~~contents~~content acquiring system to which the ~~contents~~content acquiring device according to the present embodiment is applied,

Fig. 12 is a sequence diagram showing a data flow in each section when the ~~contents~~content ~~is~~are present in the  
 15 cache section and a current date is set within a ~~valid~~  
~~term~~validity term in the ~~contents~~content acquiring system to which the ~~contents~~content acquiring device according to the present embodiment is applied,



Fig. 13 is a sequence diagram showing a data flow in each section when the ~~contents~~content ~~is~~are present in the cache section, a current date is set out of the ~~valid-~~termvalidity term and ~~contents~~content data are successfully  
 5 acquired from the ~~contents~~content server in the ~~contents~~content acquiring system to which the ~~contents~~content acquiring device according to the present embodiment is applied,

Fig. 14 is a sequence diagram showing a data flow in  
 10 each section when the ~~contents~~content ~~is~~are present in the cache section, a current date is set out of the ~~valid-~~termvalidity term and the acquisition of the ~~contents~~content data from the ~~contents~~content server is failed in the ~~contents~~content acquiring system to which the  
 15 ~~contents~~content acquiring device according to the present embodiment is applied,

Fig. 15 is a flow chart showing the summary of processing ~~contents~~content in a conventional ~~contents~~content

acquiring device,

Fig. 16 is a flow chart showing the whole summary of  
the processing ~~contents~~content of a ~~contents~~content  
acquisition processing to be carried out by the conventional  
5 ~~contents~~content acquiring device,

Fig. 17 is a flow chart showing a part of the summary of  
the processing ~~contents~~content of the content acquisition  
processing to be carried out by the conventional  
~~contents~~content acquiring device in Fig. 16,

10 Fig. 18 is a flow chart showing a part of the summary of  
the processing ~~contents~~content of the processing acquisition  
processing to be carried out by the conventional  
~~contents~~content acquiring device in Fig. 16,

Fig. 19 is a flow chart showing a part of the summary of  
15 the processing ~~contents~~content of the processing acquisition  
processing to be carried out by the conventional  
~~contents~~content acquiring device in Fig. 16,

Fig. 20 is a flow chart showing a first part of the

summary of the processing ~~contents~~content of an update  
 processing of a cache section in the conventional  
~~contents~~content acquiring device, and

Fig. 21 is a flow chart showing a second part of the  
 5 summary of the processing ~~contents~~content of the update  
 processing of the cache section in the conventional  
~~contents~~content acquiring device.

## DETAILED DESCRIPTION OF THE PREFERRED

10

## EMBODIMENTS

An embodiment of the present invention will be  
 described below.

Fig. 1 shows an example of the summary of the  
 structure of a ~~contents~~content acquiring system to which a  
 15 ~~contents~~content acquiring device according to the present  
 embodiment is applied. As described above, the  
~~contents~~content acquiring system comprises a ~~contents~~content  
 acquiring device group 15 including a personal computer 10, a

PDA 11, a laptop computer 13 having a mobile communication terminal 12 such as a PHS or a portable telephone connected as a communication interface apparatus, a portable telephone 14 having a browser function and the like, a ~~contents~~content server group 17 including first to Nth ~~contents~~content servers 16<sub>1</sub> to 16<sub>N</sub> for storing various ~~contents~~content data in a variety of fields are connected through a network 18 including a public communication network or a leased line.

In each ~~contents~~content acquiring device of the ~~contents~~content acquiring device group according to the present embodiment, preconfirmation is carried out with the update of the ~~contents~~content in the ~~contents~~content acquiring device by using a ~~valid term~~validity term previously held in the device or a ~~valid term~~validity term added at the time of the ~~contents~~content data acquisition from the ~~contents~~content server group so that a ~~contents~~content data acquisition request for the ~~contents~~content server group can be minimized.

More specifically, the ~~contents~~content acquiring device according to the present embodiment decides whether or not a ~~contents~~content acquisition request is to be transmitted from a device user to the ~~contents~~content acquisition request by

5 using the ~~valid term~~validity term previously held in the device or the ~~valid term~~validity term added at the time of the ~~contents~~content data acquisition from the ~~contents~~content server group. Herein, it is decided whether or not the ~~contents~~content requested to be acquired ~~is~~are stored in a

10 cache section provided in the ~~contents~~content acquiring device. If the ~~contents~~content ~~is~~are not stored, a ~~contents~~content acquisition request is transmitted to the ~~contents~~content server. On the other hand, when the ~~contents~~content requested to be acquired are stored in the cache section, it is

15 decided whether or not the ~~valid term~~validity term of the ~~contents~~content of the cache section or the ~~valid term~~validity term is set before a ~~contents~~content acquisition request date and a ~~contents~~content acquisition request is transmitted to

the ~~contents~~content server if the ~~valid term~~validity term is set before the acquisition request date.

When the ~~contents~~content server receives the ~~contents~~content acquisition request from the ~~contents~~content acquiring device through the network , it fetches ~~contents~~content data corresponding thereto and transmits the same ~~contents~~content data to the ~~contents~~content acquiring device. In the ~~contents~~content acquiring device, if it is decided that the ~~contents~~content acquisition request is to be transmitted from the device user to the ~~contents~~content server, the ~~contents~~content data received corresponding to the acquisition request transmitted to the ~~contents~~content server are displayed on the display section. . On the other hand, if it is decided that the ~~contents~~content acquisition request does not need to be transmitted to the ~~contents~~content server, the ~~contents~~content data stored in the cache section in the ~~contents~~content acquiring device are displayed on the display section without transmitting an acquisition request to the

~~contents~~content server.

Each ~~contents~~content acquiring device in the  
~~contents~~content acquiring device group 15 is constituted by  
each section shown in Fig. 2. More specifically, the  
5 ~~contents~~content acquiring device according to the present  
embodiment comprises an input section for accepting various  
requests sent from a device user, an external input/output  
section having an interface function together with the  
network , a display section such as a liquid crystal display  
10 (LCD) for displaying ~~contents~~content data acquired by the  
external input/output section, a cache section for temporarily  
storing the ~~contents~~content data, a timer section for timing  
an update time of the ~~contents~~content data stored in the  
cache section, and a control section for controlling each  
15 section of the device.

The control section has a central processing unit (CPU)  
which is not shown, and can execute the above-mentioned  
various control operations in accordance with a control

program stored in a predetermined storage device such as a read only memory (ROM) which is not shown.

Since the summary of the processing of the ~~contents~~content acquiring device according to the present embodiment is the same as that in Fig. 15, description will be omitted. The ~~contents~~content acquiring device according to the present embodiment has different processing ~~contents~~content based on a ~~contents~~content acquisition processing control program stored in a memory (not shown) in the control section therein.

The network and the ~~contents~~content server are well known to the skilled in the art and the detailed description of the structure and operation will be omitted.

Figs. 3 to 7 show the summary of processing ~~contents~~content of a control program to be executed by the ~~contents~~content acquiring device according to the present embodiment. The control section analyzes the request for ~~contents~~content acquisition which is accepted by the input



section 25 and gives an instruction of the ~~contents~~content acquisition request to the display section. The display section displays the ~~contents~~content acquisition request in accordance with the instruction sent from the control section.

5 The control section specifies the requested ~~contents~~content data, and retrieves the cache section to decide whether or not ~~there are data from the requested contents data is~~ present (Step S100). When it is decided that ~~there are not~~ the ~~contents~~content data requested to be acquired by are

10 not present in the cache section (Step S100: N), an instruction for transmitting a request for acquiring the ~~contents~~content data is given to the external input/output section (Step S101). The external input/output section transmits a ~~contents~~content acquisition request through the network ~~infra~~ to the

15 ~~contents~~content server ~~for storing contents content data~~ acquired and requested.

The external input/output section monitors the normal receipt of the ~~contents~~content data from the ~~contents~~content

server ~~to be~~serving as a contentscontent request destination through the network, and transfers the received contentscontent data to the control section when detecting the normal receipt. When the control section acquires the

5 contentscontent data normally ~~received by the external~~  
~~input/output section~~ (Step S102: Y), it updates the cache section ~~by using~~ the acquired contentscontent (Step S103) and gives an instruction for displaying the received contentscontent to the display section (Step S104). The

10 display section displays the received contentscontent in response to the instruction given from the control section. Then, ~~a series of processings area~~ processing section is ended (End).

On the other hand, when the external input/output

15 section cannot receive the contentscontent data from the contentscontent server ~~to be~~serving as the acquisition request destination through the network and the control section cannot acquire the contentscontent data (Step S102:

N), the control section deletes the contentscontent stored in the cache section and gives the display section an instruction to display ~~of~~ contentscontent acquisition failure (Step S105). For example, when the contentscontent data requested from

5 the contentscontent server cannot be acquired within a constant-specified time corresponding to the contentscontent acquisition request transmitted from the external input/output section or when the contentscontent data requested to be acquired in the contentscontent server cannot

10 be found or there are no contentscontent data requested to be acquired, the above-mentioned processing is carried out. At that time, the display section ~~gives an instruction of the~~ displays contentscontent acquisition failure in response to the instruction sent from the control section. Then, ~~a series of~~

15 ~~processings~~ area processing section is ended (END).

When it is decided that the cache section has the contentscontent data required to be acquired at the Step S100 (Step S100: Y), the control section decides whether or not a

~~valid term~~validity term ~~is~~ has been added to the  
~~contents~~content data requested ~~to be acquired~~ which are  
 stored in the cache section (Step S106). The ~~valid~~  
~~term~~validity term ~~is~~ would have been added at the time when  
 5 the ~~contents~~content ~~are~~ was acquired from the  
~~contents~~content server. When it is decided that the ~~valid~~  
~~term~~validity term ~~is~~ has been added to the ~~contents~~content  
 data requested ~~to be acquired~~ which are stored in the cache  
 section (Step S106: Y), the ~~valid term~~validity term is  
 10 compared with the ~~valid term~~validity term previously held in  
 the ~~contents~~content acquiring device (Step S107). When the  
~~valid term~~validity term of the ~~contents~~content data in the  
 cache section is smaller than the ~~valid term~~validity term held  
 in the device (Step S107: Y), the control section makes the  
 15 ~~valid term~~validity term of the ~~contents~~content data in the  
 cache section valid (Step S108). When the ~~valid term~~validity  
term of the ~~contents~~content data in the cache section is equal  
 to or more than the ~~valid term~~validity term held in the device

(Step S107: N), the ~~valid term~~validity term previously held in the ~~contents~~content acquiring device is made valid (Step S109).

Moreover, when it is decided that the ~~valid term~~validity term  
 5 ~~term is was~~ not added to the ~~contents~~content data requested to be acquired which are stored in the cache section at the Step S106 (Step S106: N), the ~~valid term~~validity term previously held in the ~~contents~~content acquiring device is made valid (Step S109).

10 After the ~~valid term~~validity term of the ~~contents~~content in the cache section or the ~~valid term~~validity term previously held in the ~~contents~~content acquiring device is made valid at the Steps S108 and S109, it is decided whether or not the ~~valid term~~validity term is added to the ~~contents~~content data  
 15 requested to be acquired which are stored in the cache section (Step S110). The ~~valid term~~validity term ~~is was~~ previously added by the ~~contents~~content server or added during acquisition from the ~~contents~~content server, for example.

When it is decided that the ~~valid term~~validity term is added to the ~~contents~~content stored in the cache section (Step S110: Y), the control section decides whether or not a final update date is added to the ~~contents~~content stored in the cache section (Step S111). The final update date is added during the acquisition of the ~~contents~~content. When it is decided that the final update date is added to the ~~contents~~content stored in the cache section (Step S111: Y), the ~~valid term~~validity term made valid at the Step S108 or S109 is added to the final update date of the ~~contents~~content stored in the cache section and a "final update ~~valid date~~validity date" expressed in Equation (1) is calculated.

$$\begin{aligned} &(\text{Final update } \del{\text{valid}}\u{\text{validity date}}) = (\text{final update date}) + \\ &(\del{\text{valid}}\u{\text{validity term}}) \end{aligned}$$

... (1)

Subsequently, the control section compares the final update ~~valid-date~~validity date thus calculated with a ~~contents~~content acquisition date of the ~~contents~~content stored in the cache section (Step S112). When the final update

5 ~~valid-date~~validity date is smaller than the ~~contents~~content acquisition date of the ~~contents~~content stored in the cache section (Step S112: Y), the control section compares the ~~valid-term~~validity term of the ~~contents~~content stored in the cache section with the final update ~~valid-date~~validity date thus

10 calculated (Step S113). When the ~~valid-term~~validity term of the ~~contents~~content stored in the cache section is smaller than the final update ~~valid-date~~validity date (Step S113: Y), the control section makes the ~~valid-term~~validity term of the ~~contents~~content stored in the cache section valid (Step S114).

15 When the ~~valid-term~~validity term of the ~~contents~~content stored in the cache section is equal to or greater than the final update ~~valid-date~~validity date at the Step S113 (Step S113: N), the control section sets the calculated final update

~~valid-date~~validity date to be a ~~valid-term~~validity term (Step S115).

When the final update ~~valid-date~~validity date is equal to or greater than the ~~contents~~content acquisition date of the ~~contents~~content stored in the cache section (Step S112: N), the control section adds the ~~valid-term~~validity term made valid at the Step S108 or the Step S109 to the ~~contents~~content acquisition date of the ~~contents~~content stored in the cache section and a "~~contents~~content acquisition ~~valid-date~~validity ~~date~~" expressed in Equation (2) is calculated.

$$\begin{aligned}
 &(\text{Content}\text{Content acquisition } \text{valid-}\text{validity date}) = \\
 &(\text{contents}\text{content acquisition date}) + (\text{valid-}\text{validity term}) \\
 &\dots \quad (2)
 \end{aligned}$$

Subsequently, the control section compares the ~~contents~~content acquisition ~~valid-date~~validity date thus calculated with the ~~valid-term~~validity term of the



~~contents~~content stored in the cache section (Step S116).

When the ~~valid term~~validity term of the ~~contents~~content

stored in the cache section is smaller than the

~~contents~~content acquisition ~~valid date~~validity date (step

5 S116: Y), the control section makes the ~~valid term~~validity term of the ~~contents~~content stored in the cache section valid

(Step S117). When the ~~valid term~~validity term of the

~~contents~~content stored in the cache section is equal to or

greater than the ~~contents~~content acquisition ~~valid~~

10 ~~date~~validity date (Step S116: N), the control section makes the calculated ~~contents~~content acquisition ~~valid date~~validity date valid (Step S118).

When it is decided that the ~~valid term~~validity term is not added to the ~~contents~~content stored in the cache section

15 at the Step S110 (Step S110: N), the control section decides whether or not the final update date is added to the

~~contents~~content stored in the cache section (Step S119).

When it is decided that the final update date is added to the

~~contents~~content stored in the cache section (Step S119: Y), the control section compares the ~~contents~~content acquisition ~~valid~~  
~~date~~validity date calculated in the same manner as in the Equation (2) with the final update ~~valid~~date  
5     calculated in the same manner as in the Equation (1) (Step S120). When the ~~contents~~content acquisition ~~valid~~  
~~date~~validity date is smaller than the final update ~~valid~~  
~~date~~validity date (Step S120: Y), the control section makes valid the ~~contents~~content acquisition ~~valid~~date  
10     obtained as a ~~valid~~expirationvalidity expiration by adding the ~~valid~~termvalidity term valid for the ~~contents~~content  
acquisition date of the ~~contents~~content stored in the cache section (Step S121). When the ~~contents~~content acquisition  
~~valid~~datevalidity date is equal to or greater than the final  
15     update ~~valid~~datevalidity date (Step S120: N), the control section makes valid the final update ~~valid~~date  
~~valid~~datevalidity date obtained as a ~~valid~~expirationvalidity expiration by adding the ~~valid~~termvalidity term valid for the final update date of

the ~~contents~~content stored in the cache section (Step S122).

On the other hand, it is decided that the final update date is not added to the ~~contents~~content stored in the cache section at the Step S119 (Step S119: N), the control section  
 5 makes valid the ~~contents~~content acquisition ~~valid-date~~validity ~~date~~ obtained as a ~~valid~~-validity expiration by adding the ~~valid~~-validity term valid for the ~~contents~~content acquisition date stored in the cache section (Step S123).

At the Step S111, moreover, it is decided that the final  
 10 update is not added to the ~~contents~~content stored in the cache section (Step S111: N), the control section compares the ~~valid~~-~~expiration~~validity expiration of the ~~contents~~content stored in the cache section with the ~~contents~~content acquisition ~~valid~~-~~date~~validity date calculated in the same manner as in the  
 15 Equation (2) (Step S124). When the ~~valid~~-~~expiration~~validity ~~expiration~~ of the ~~contents~~content stored in the cache section is smaller than the calculated ~~contents~~content acquisition ~~valid~~-~~date~~validity date (Step S124: Y), the control section

makes the ~~valid-expiration~~validity expiration stored in the  
 cache section valid (Step S125). When the ~~valid-~~  
~~expiration~~validity expiration of the ~~contents~~content stored in  
 the cache section is equal to or greater than the calculated  
 5 ~~contents~~content acquisition ~~valid-date~~validity date (Step  
 S124: N), the control section makes the calculated  
~~contents~~content acquisition ~~valid-date~~validity date valid as a  
~~valid-expiration~~validity expiration (Step S126).

When the ~~valid-expiration~~validity expiration is set at  
 10 any of the Steps S114, S115, S117, S118, S121 to S123, S125  
 and S126, the control section decides whether or not a current  
 date timed by the timer section in the device passes the ~~valid-~~  
~~expiration~~validity expiration added to the ~~contents~~content  
 (Step S127). When it is decided that the current time  
 15 obtained by the timer section is out of the ~~valid-~~  
~~expiration~~validity expiration added to the ~~contents~~content  
 (Step S127: N), the control section gives an instruction for  
 transmitting a ~~contents~~content acquisition request to the

external input/output section (Step S128). The external  
 input/output section transmits the ~~contents~~content  
 acquisition request to the ~~contents~~content server through the  
 network in response to the instruction sent from the control  
 5 section.

The external input/output section monitors the normal  
 receipt of the ~~contents~~content data from the ~~contents~~content  
 server to be a ~~contents~~content request destination through  
 the network, and transfers the received ~~contents~~content data  
 10 to the control section when detecting the normal receipt.  
 When the control section acquires the ~~contents~~content data  
 normally received by the external input/output section (Step  
 S129: Y), it updates the cache section only if the acquired  
~~contents~~content ~~is~~are updated (Step S130: Y, Step S131) and  
 15 gives an instruction for displaying the received  
~~contents~~content to the display section (Step S132). The  
 display section displays the received ~~contents~~content in  
 response to the instruction given from the control section.

When the acquired contentscontent ~~is~~are not updated, the  
 cache section is not updated (Step S130: N, Step S131) and  
 exactly gives an instruction for displaying the received  
~~contents~~content to the display section (Step S132). Then, a  
 5 ~~series of processings~~area processing section is ended (END).

When the external input/output section cannot receive  
 the contentscontent data from the contentscontent server to  
 be an acquisition request destination through the network  
 and the control section cannot acquire the contentscontent  
 10 data at the Step S129 (Step S129: N), the control section  
 deletes the contentscontent stored in the cache section (Step  
 S133) and gives an instruction for displaying a  
contentscontent acquisition failure to the display section  
 (Step S134). This operation is carried out when the  
 15 contentscontent data requested from the contentscontent  
 server for a constant time cannot be acquired corresponding  
 to the contentscontent acquisition request transmitted from  
 the external input/output section, for example, or when the

~~contents~~content data requested to be acquired in the  
~~contents~~content server cannot be found or there are no  
~~contents~~content data requested to be acquired. At that time,  
the display section displays indication of a ~~contents~~content  
5 acquisition failure in response to the instruction sent from  
the control section. Then, ~~a series of processings area~~  
processing section is ended (END).

When it is decided that the current time obtained by the  
timer section does not expire the ~~valid term~~validity term  
10 added to the ~~contents~~content at the Step S127 (Step S127: Y),  
the control section fetches the ~~contents~~content from the cache  
section 28 (Step S135) and gives an instruction for  
transmitting a ~~contents~~content acquisition request to the  
display section (Step S136). The display section displays the  
15 fetched ~~contents~~content in response to the instruction sent  
from the control section. Then, ~~a series of processings area~~  
processing section is ended (END).

Fig. 8 represents a main part of the processing

~~contents~~content of the update processing of the cache section  
 shown in Figs. 3 and 7. The cache section has a cache  
 control section for controlling the whole cache section and  
 carries out the following processing to update the cache  
 5 section. When the cache control section in the cache section  
 is to store ~~contents~~content in the cache section in response to  
 an instruction sent from the control section, it first retrieves  
 that the same ~~contents~~content ~~is~~are stored in the cache  
 section or not (Step S140). When the cache control section  
 10 detects that the same ~~contents~~content are stored in the cache  
 section (Step S140: Y), it deletes the same ~~contents~~content  
 stored in the cache section (Step S141) and carries out the  
 rotation of the ~~contents~~content (Step S142). The rotation  
 serves to change the arrangement of the ~~contents~~content  
 15 stored in the cache section in order of acquisition, and the  
~~contents~~content stored finally in the cache section ~~is~~are the  
 most newly acquired ~~contents~~content on a time basis.

On the other hand, when the cache control section



detects that the same ~~contents~~content ~~is~~are not stored in the  
 cache section at the Step S140 (Step S140: N), it is decided  
 whether the ~~contents~~content ~~is~~are stored in all entries of the  
 cache section (Step S143). When it is decided that the  
 5 ~~contents~~content ~~is~~are stored in all entries (Step S143: Y), the  
 cache control section deletes ~~contents~~content on the head of  
 the cache section (Step S144) and carries out the rotation of  
 the ~~contents~~content (Step S145).

After the rotation of the cache section is carried out at  
 10 the Steps S142 and S145 or it is decided that the  
~~contents~~content ~~is~~are not stored in all the entries of the cache  
 section at the Step S143 (Step S143: N), the cache control  
 section adds the ~~contents~~content requested to be stored by the  
 control section to the end of the cache section (Step S146).

15 In this case, the cache control section decides whether  
 or not a ~~valid term~~validity term is added when the  
~~contents~~content requested to be stored by the control section  
 are acquired (Step S147). When it is decided that the ~~valid~~

~~term~~validity term is added (Step S147: Y), the cache control section adds the ~~valid~~~~term~~validity term added to the ~~contents~~content requested to be stored by the control section to the ~~contents~~content stored finally in the cache section

5 (Step S148). On the other hand, when the control section decides that the ~~valid~~~~term~~validity term is not added to the ~~contents~~content requested to be stored by the control section at the Step S147 (Step S147: N), the cache control section adds "no ~~valid~~~~term~~validity term" to the ~~contents~~content

10 stored finally in the cache section 28 (Step S149).

Next, the cache control section decides whether or not a ~~valid~~~~expiration~~validity expiration is added when the ~~contents~~content requested to be stored by the control section are acquired (Step S150). When it is decided that the ~~valid~~

15 ~~expiration~~validity expiration is added (Step S150: Y), the cache control section adds the ~~valid~~~~expiration~~validity expiration added to the ~~contents~~content requested to be stored by the control section to the ~~contents~~content stored finally in

the cache section (Step S151). On the other hand, when the control section decides that the ~~valid expiration~~validity expiration is not added to the ~~contents~~content requested to be stored by the control section at the Step S150 (Step S150: N),

5 the cache control section adds "no ~~valid expiration~~validity expiration" to the ~~contents~~content stored finally in the cache section (Step S152).

Then, the cache control section decides whether or not a final update date is added to the ~~contents~~content when the

10 ~~contents~~content requested to be stored by the control section are acquired (Step S153). When it is decided that the final update date is added to the ~~contents~~content requested to be stored by the control section (Step S153: Y), the cache control section adds the final update date to the ~~contents~~content

15 stored finally in the cache section (Step S154). On the other hand, when the control section decides that the final update date is not added to the ~~contents~~content requested to be stored by the control section at the Step S153 (Step S153: N),

the cache control section adds "no final update date" to the ~~contents~~content stored finally in the cache section (Step S155).  
Finally, the cache control section adds the current date timed by the timer section as the ~~contents~~content acquisition date to  
5 the ~~contents~~content stored finally in the cache section (step S156), and ~~a series of processings area~~ a processing section is ended (End).

Next, the operation of the ~~contents~~content acquiring device according to the present embodiment will be described  
10 specifically.

Fig. 10 shows a data flow in each section in the case in which ~~contents~~content ~~is~~are not present in the cache section and the acquisition of the ~~contents~~content data from the ~~contents~~content server is successful in a ~~contents~~content  
15 acquiring system to which the ~~contents~~content acquiring device according to the present embodiment is applied. More specifically, when an acquisition request 160 is given from the user of the ~~contents~~content acquiring device through the

input section, information indicative of the acquisition request is sent to the control section (acquisition request notice 161). The control section analyses the indication information and gives an instruction for display to the display section when the result of the analysis is the ~~contents~~content acquisition request (acquisition notice 162). The control section retrieves the cache section based on the analyzed ~~contents~~content acquisition request (retrieval 163).

Assuming that there are not ~~contents~~content in the cache section, the control section receiving a "no ~~contents~~content" 164 as the result of the retrieval of the cache section, gives an instruction for a transmission 165 of the ~~contents~~content acquisition request to the external input/output section. The external input/output section transmits a ~~contents~~content acquisition request 166 to the ~~contents~~content server, and monitors the receipt of ~~contents~~content data 167 requested to be acquired.

When receiving the ~~contents~~content data requested to

be acquired, the external input/output section gives a notice to the control section as received ~~contents~~content data 168.

The control section adds a ~~valid term~~validity term, a ~~valid~~expirationvalidity expiration, a final update date and a

5 ~~contents~~content acquisition date to the received ~~contents~~content as shown in Figs. 8 and 9 and gives an instruction for storage to the cache section (storage 169), and gives the display section an instruction for displaying the received ~~contents~~content data (display 170).

10 Fig. 11 shows a data flow in each section in the case in which ~~contents~~content ~~is~~are not present in the cache section and the acquisition of the ~~contents~~content data from the ~~contents~~content server is ~~failed~~fails in the ~~contents~~content acquiring system to which the ~~contents~~content acquiring  
 15 device according to the present embodiment is applied. The same data as those in the case in which the ~~contents~~content data acquisition is successful as shown in Fig. 10 have the same reference numerals and description thereof will be

omitted. More specifically, after the contentscontent acquisition request 166 is transmitted to the contentscontent server by the external input/output section based on the acquisition request 160 input from the user of the

5 contentscontent acquiring device through the input section, the receipt of the contentscontent data 167 requested to be acquired is monitored.

When the contentscontent data requested from the contentscontent server cannot be acquired for a ~~constant~~

10 specified time corresponding to the transmitted contentscontent acquisition request or the contentscontent data requested to be acquired cannot be found or are not present in the contentscontent server, for example, the external input/output section gives an instruction for a

15 contentscontent acquisition failure display 177 to the display section as described in the Step S105 shown in Fig. 3 if a message of the contentscontent acquisition failure is given as a contentscontent acquisition failure notice 176 to the control

section based on a ~~contents~~content acquisition failure message 175 given from the ~~contents~~content server.

Fig. 12 shows a data flow in each section in the case in which ~~the contents~~content ~~are~~ is present in the cache section and the current date is within the ~~valid term~~validity term in the ~~contents~~content acquiring system to which the ~~contents~~content acquiring device according to the present embodiment is applied. The same data as those in the case in which the ~~contents~~content data acquisition is successful as shown in Fig. 10 have the same reference numerals and description thereof will be omitted. More specifically, the cache retrieval 163 is transmitted to the cache section based on the acquisition request 160 input from the user of the ~~contents~~content acquiring device through the input section and a notice 180 indicative of the presence of the ~~contents~~content is received correspondingly. After a ~~valid term~~validity term and a ~~valid expiration~~validity expiration are set as shown in Figs. 3 to 6, an instruction for a



~~contents~~content fetch 181 is given to the cache section as described in the Step S135 shown in Fig. 7 when it is decided that the current date is within the ~~valid term~~validity term.

When the ~~contents~~content corresponding to the

- 5 ~~contents~~content fetch request are received from the cache section (contents receipt 182), an instruction for a display 183 for the ~~contents~~content data received is given to the display section.

- Fig. 13 shows a data flow in each section in the case in  
 10 which ~~contents~~content ~~is~~are present in the cache section, the current date is out of the ~~valid term~~validity term and the ~~contents~~content data acquisition from the ~~contents~~content server is successful in the ~~contents~~content acquiring system to which the ~~contents~~content acquiring device according to the  
 15 present embodiment is applied. The same data as those in the case in which the ~~contents~~content data acquisition is successful as shown in Fig. 10 have the same reference numerals and description thereof will be omitted. More

specifically, the cache retrieval 163 is transmitted to the cache section based on the acquisition request 160 input from the user of the ~~contents~~content acquiring device through the input section and a notice 185 indicative of the presence of

5 the ~~contents~~content is received correspondingly. After a ~~valid term~~validity term and a ~~valid expiration~~validity expiration are set as shown in Figs. 3 to 6, an instruction for a ~~contents~~content acquisition request transmission 186 is first given to the external input/output section as described in

10 the Steps S128 to S132 shown in Fig. 7 when it is decided that the current date is out of the ~~valid term~~validity term. The external input/output section transmits a ~~contents~~content acquisition request 187 through the network and monitors the receipt of the ~~contents~~content data requested to be acquired.

15 When receiving the ~~contents~~content data 188 requested to be acquired, the external input/output section gives a notice to the control section as received ~~contents~~content data 189. If the received ~~contents~~content ~~is~~are updated in the

~~contents~~content server, the control section adds a ~~valid-~~  
~~term~~validity term, a ~~valid-expiration~~validity expiration, a  
 final update date and a ~~contents~~content acquisition date to  
 the cache section as shown in Figs. 8 and 9, carries out an  
 5 update 190 of the cache section and gives the display section  
 an instruction for display of the received ~~contents~~content data  
 (display 191).

Fig. 14 shows a data flow in each section in the case in  
 which ~~contents~~content are present in the cache section, the  
 10 current date is out of the ~~valid-term~~validity term and the  
 acquisition of the ~~contents~~content data from the  
~~contents~~content server ~~is failed~~fails in the ~~contents~~content  
 acquiring system to which the ~~contents~~content acquiring  
 device according to the present embodiment is applied. The  
 15 same data as those in the case in which the ~~contents~~content  
 data acquisition is successful as shown in Fig. 13 have the  
 same reference numerals and description thereof will be  
 omitted. More specifically, after the notice 185 indicative of

the presence of the ~~contents~~content is received corresponding to the cache retrieval 163 transmitted to the cache section and a ~~valid term~~validity term and a ~~valid expiration~~validity expiration are set as shown in Figs. 3 to 6 based on the

5 acquisition request 160 input from the user of the ~~contents~~content acquiring device through the input section, the instruction for the ~~contents~~content acquisition request transmission 186 is first given to the external input/output section as described in the Steps S128 to S132 shown in Fig. 7

10 when it is decided that the current date is out of the ~~valid term~~validity term. The external input/output section transmits the ~~contents~~content acquisition request 187 through the network and monitors the receipt of the ~~contents~~content data requested to be acquired.

15 When the ~~contents~~content data requested from the ~~contents~~content server cannot be acquired for a ~~constant~~specified time corresponding to the transmitted ~~contents~~content acquisition request or the ~~contents~~content

data requested to be acquired cannot be found or are not present in the ~~contents~~content server, for example, the external input/output section transmits a corresponding ~~contents~~content deleting instruction 197 to the cache section

5 and gives an instruction for a ~~contents~~content acquisition failure display 198 to the display section as described in the Step S133 shown in Fig. 7, if a message of the ~~contents~~content acquisition failure is given as a ~~contents~~content acquisition failure notice 196 to the control section based on a

10 ~~contents~~content acquisition failure message 195 given from the ~~contents~~content server.

In the ~~contents~~content acquiring device according to the present embodiment, thus, a ~~parameter of the valid-~~  
~~term~~validity term parameter of the ~~contents~~content is

15 provided, the ~~valid term~~validity term is newly used to previously decide in the device whether or not the ~~contents~~content ~~is~~are to be updated, and an acquisition request to be an access to the ~~contents~~content server storing

the ~~contents~~content data requested to be acquired through the network is then transmitted. Consequently, in the case in which the ~~contents~~content requested to be acquired is particularly present in the cache section, the access to the ~~contents~~content server can be suppressed based on the ~~valid-~~term validity term of the ~~contents~~content and an access time required for the use of the ~~contents~~content in the cache section can be reduced. Correspondingly, an unnecessary load is not applied to the network and a throughput in the network can be enhanced. Moreover, ~~the parameter of the~~ valid term validity term parameter is provided in the ~~contents~~content acquiring device itself. Consequently, even if the ~~valid term~~validity term is not added when the ~~contents~~content data stored in the ~~contents~~content server are acquired, it can be previously decided in the device whether or not the ~~contents~~content ~~is~~are to be updated based on the ~~valid term~~validity term previously held in the device. Thus, the present invention can be applied to the conventional

~~contents~~content acquiring system.

Although there has been described the ~~contents~~content acquiring device according to the present embodiment which serves to decide based on the "day" whether the

5 ~~contents~~content ~~is~~are to be updated or not, this is not restricted. For example, the decision may be carried out based on a "date".

According to the first or third aspect of the present invention, as described above, in the case in which the

10 ~~contents~~content requested to be acquired are in the cache section, an access to the ~~contents~~content server can be controlled based on the ~~valid-term~~validity term of the ~~contents~~content, and an access time required for using the ~~contents~~content in the cache section can be reduced.

15 Correspondingly, an unnecessary load is not applied to the network and a throughput in the network can be enhanced.

According to the second or fourth aspect of the present invention, furthermore, the parameter of the ~~valid-~~

~~term~~validity term is provided in the ~~eontents~~content acquiring device itself. Consequently, even if the ~~valid-~~  
~~term~~validity term is not added when the ~~eontents~~content data stored in the ~~eontents~~content server are acquired, it can be  
5 previously decided in the device whether or not the ~~eontents~~content ~~is~~are to be updated based on the ~~valid-~~  
~~term~~validity term previously held in the device. Thus, the present invention can be applied to a conventional  
~~eontents~~content acquiring system.

10 According to the fifth aspect of the present invention, it is sufficient that the ~~eontents~~content are fetched and returned for the acquisition request transmitted only when the ~~eontents~~content are not within the ~~valid-~~  
~~expiration~~validity expiration set based on the ~~valid-~~  
15 ~~term~~validity term of the ~~eontents~~content stored in the cache. Therefore, a processing load in the ~~eontents~~content server can also be reduced considerably. Thus, it is possible to provide a comfortable ~~eontents~~content service for the user.



According to the sixth aspect of the present invention, furthermore, when the ~~valid-term~~validity term is not added to the ~~contents~~content stored in the cache, the ~~valid-expiration~~validity expiration is set based on the ~~valid-term~~validity term previously held in the destination of the acquisition request. Consequently, it is not necessary to give the ~~parameter of the valid-term~~validity term parameter to all the ~~contents~~content previously stored on the ~~contents~~content server side, and existing equipment can be applied.

According to the seventh to tenth aspects of the present invention, a traffic on the network can be relieved and a large number of ~~contents~~content acquisition requests can be processed. According to the eighth or tenth aspect of the present invention, particularly, when the ~~valid-term~~validity term is not set to the ~~contents~~content to be an acquisition object, the ~~valid-expiration~~validity expiration is set based on a predetermined ~~valid-term~~validity term previously held.

Consequently, an existing device is applied to reduce an equipment investment and the acquisition request can be minimized. Thus, it is possible to provide a comfortable ~~contents~~content service for the user to request the

5 ~~contents~~content acquisition.

## WHAT IS CLAIMED IS:

1. A ~~contents~~content acquiring device comprising:

cache means for temporarily storing received

5 ~~contents~~content;

acquisition request accepting means for accepting an  
acquisition request for ~~contents~~content;

cache deciding means for deciding whether the  
~~contents~~content requested by the acquisition request are  
10 stored in the cache means or not;

~~valid-expiration~~validity expiration setting means for  
setting a ~~valid-expiration~~validity expiration as an update  
expiration of the ~~contents~~content based on a ~~valid-~~  
~~term~~validity term of the ~~contents~~content when it is decided by  
15 the cache deciding means that the ~~contents~~content are stored  
in the cache means;

acquisition request transmitting means for transmitting  
the acquisition request for the ~~contents~~content when the

~~contents~~content are out of the ~~valid expiration~~validity expiration set by the ~~valid expiration~~validity expiration setting means; and

~~contents~~content receiving means for receiving  
 5 ~~contents~~content based on the acquisition request transmitted from the acquisition request transmitting means.

2. The ~~contents~~content acquiring device according to claim 1, further comprising ~~valid term~~validity term holding means for  
 10 previously holding a ~~valid term~~validity term, and ~~valid term~~validity term addition deciding means for deciding whether the ~~valid term~~validity term is added to the ~~contents~~content or not when it is decided by the cache deciding means that the ~~contents~~content are stored in the  
 15 cache means, the ~~valid expiration~~validity expiration setting means serving to set the ~~valid expiration~~validity expiration based on a ~~valid term~~validity term held by the ~~valid term~~validity term holding means when it is decided by the

~~valid term~~validity term addition deciding means that the  
~~valid term~~validity term is not added.

3. A method of acquiring ~~contents~~content comprising the  
 5 steps of:

acquisition request accepting means for accepting an  
 acquisition request for ~~contents~~content;

deciding whether or not the ~~contents~~content requested  
 by the acquisition request accepted at the acquisition request  
 10 accepting step are stored in a cache for temporarily storing  
 received ~~contents~~content;

setting a ~~valid expiration~~validity expiration as an  
 update expiration of the ~~contents~~content based on a ~~valid~~  
~~term~~validity term added to the ~~contents~~content when it is  
 15 decided at the cache deciding step that the ~~contents~~content  
 are stored in the cache;

transmitting the acquisition request for the  
~~contents~~content when the ~~contents~~content are out of the ~~valid~~

~~expiration~~validity expiration set at the ~~valid-~~  
~~expiration~~validity expiration setting step; and

receiving ~~eontents~~content corresponding to the  
 acquisition request transmitted at the acquisition request  
 5 transmitting step.

4. The method of acquiring ~~eontents~~content according to  
 claim 3, further comprising the step of deciding whether the  
~~valid-term~~validity term is added to the ~~eontents~~content or not  
 10 when it is decided at the cache deciding step that the  
~~eontents~~content are stored in the cache, the ~~valid-~~  
~~expiration~~validity expiration setting step serving to set the  
~~valid-expiration~~validity expiration based on a previously held  
~~valid-term~~validity term when it is decided at the ~~valid-~~  
 15 ~~term~~validity term addition deciding step that the ~~valid-~~  
~~term~~validity term is not added.

5. A ~~eontents~~content server comprising:

~~contents~~content storing means for previously storing  
~~contents~~content;

acquisition request receiving means for receiving an  
 acquisition request transmitted when the ~~contents~~content are  
 5 out of a ~~valid expiration~~validity expiration to be an update  
 expiration of the ~~contents~~content stored in a cache which are  
 set based on a ~~valid term~~validity term of the ~~contents~~content;  
 and

~~contents~~content transmitting means for fetching the  
 10 ~~contents~~content requested by the acquisition request received  
 by the acquisition request receiving means from the  
~~contents~~content storing means and for transmitting the  
~~contents~~content to a destination of the acquisition request.

15 6. The ~~contents~~content server according to claim 5, wherein  
 the ~~valid expiration~~validity expiration is set based on a ~~valid~~  
~~term~~validity term previously held in the destination of the  
 acquisition request when the ~~valid term~~validity term is not

added to the ~~contents~~content stored in the cache.

7. A ~~contents~~content acquiring system comprising:

a ~~contents~~content acquiring device for transmitting an  
5 acquisition request of ~~contents~~content to be an acquisition  
request object prestored through a network when the  
~~contents~~content are out of a ~~valid expiration~~validity  
expiration to be an update expiration of the ~~contents~~content  
set based on a ~~valid term~~validity term of the ~~contents~~content  
10 and for receiving ~~contents~~content corresponding thereto; and  
a ~~contents~~content server for reading ~~contents~~content  
corresponding to an acquisition request transmitted from the  
~~contents~~content acquiring device from ~~contents~~content in  
various fields which are prestored, and for transmitting the  
15 ~~contents~~content corresponding to the acquisition request to  
the ~~contents~~content acquiring device through the network.

8. The ~~contents~~content acquiring system according to claim



7, wherein the ~~valid expiration~~validity expiration is set based on a predetermined ~~valid term~~validity term previously held when a ~~valid term~~validity term is not added to the ~~contents~~content to be an acquisition object.

5

9. A ~~contents~~content acquiring system comprising:

a ~~contents~~content acquiring device including cache means for temporarily storing received ~~contents~~content, acquisition request accepting means for accepting an

10 acquisition request for ~~contents~~content, cache deciding means for deciding whether the ~~contents~~content requested by the acquisition request are stored in the cache means or not, ~~valid expiration~~validity expiration setting means for setting a ~~valid expiration~~validity expiration as an update expiration of the

15 ~~contents~~content based on a ~~valid term~~validity term added to the ~~contents~~content when it is decided by the cache deciding means that the ~~contents~~content are stored in the cache means, acquisition request transmitting means for transmitting the

acquisition request for the ~~contents~~content when the  
~~contents~~content are out of the ~~valid expiration~~validity  
~~expiration~~ set by the ~~valid expiration~~validity expiration  
 setting means, and ~~contents~~content receiving means for  
 5 receiving ~~contents~~content based on the acquisition request  
 transmitted from the acquisition request transmitting means;  
 and

a ~~contents~~content server including ~~contents~~content  
 storing means for previously storing ~~contents~~content,  
 10 acquisition request receiving means for receiving an  
 acquisition request transmitted from the acquisition request  
 transmitting means, and ~~contents~~content transmitting means  
 for fetching the ~~contents~~content requested by the acquisition  
 request received by the acquisition request receiving means  
 15 from the ~~contents~~content storing means and for  
 transmitting the ~~contents~~content to the acquisition request.

10. The ~~contents~~content acquiring system according to claim

9, further comprising ~~valid-term~~validity term holding means  
for previously holding a ~~valid-term~~validity term, and ~~valid-~~  
~~term~~validity term addition deciding means for deciding  
whether the ~~valid-term~~validity term is added to the  
5 ~~contents~~content or not when it is decided by the cache  
deciding means that the ~~contents~~content are stored in the  
cache means, the ~~valid-expiration~~validity expiration setting  
means serving to set the ~~valid-expiration~~validity expiration  
based on a ~~valid-term~~validity term held by the ~~valid-~~  
10 ~~term~~validity term holding means when it is decided by the  
~~valid-term~~validity term addition deciding means that the  
~~valid-term~~validity term is not added.

## ABSTRACT OF THE DISCLOSURE

To provide a ~~contents~~content acquiring device, a  
~~contents~~content acquiring method, a ~~contents~~content server  
5 and a ~~contents~~content acquiring system which can minimize  
an acquisition request for ~~contents~~content data and can  
acquire ~~contents~~content data having a current version as  
much as possible. By using a ~~valid term~~validity term  
previously held by the ~~contents~~content acquiring device or a  
10 ~~valid term~~validity term of the ~~contents~~content added during  
~~contents~~content acquisition, it is previously decided in the  
device whether the ~~contents~~content are to be updated or not,  
thereby transmitting an acquisition request to be an access to  
a ~~contents~~content server for storing ~~contents~~content data  
15 requested to be acquired through a network .